Evaluation of Photon Sieve for Lidar Systems

Completed Technology Project (2017 - 2018)

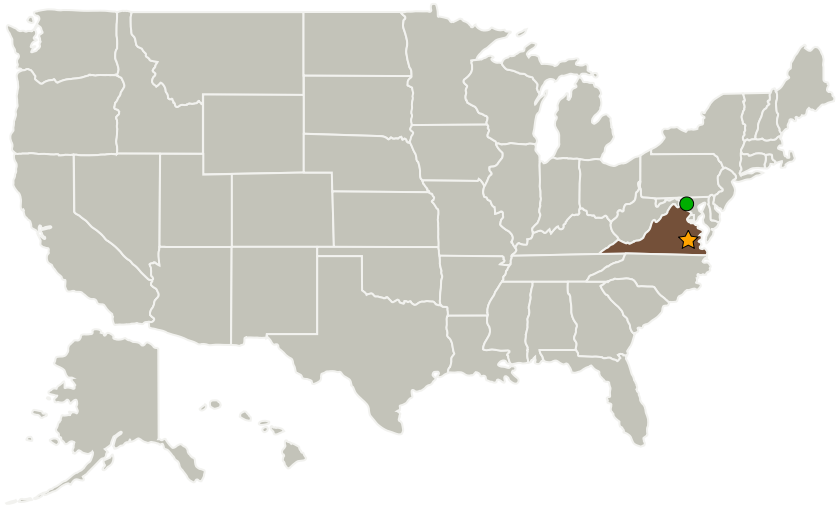
Project Introduction

What are the key technical challenges? Characterizing the optical properties of each sample design consistently for diffraction efficiency and polarization crosstalk. Designing/Manufacturing samples that enhance throughput. Employing solar noise separation techniques. Large scale (6 inch) designs push system capacity for file size; What is your approach/research plan? Multi-disciplined team with science application focus 4 groups: Modeling, Manufacturing, Characterization, Science. What are the innovative aspects (how is this different than what others are doing in industry, academia government)? Focused on challenges that limit atmospheric LIDAR deployment on a smallsat system (polarization maintenance, SNR)

Anticipated Benefits

The photon sieve technology has excellent potential in astrophysics and heliophysics

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Ball Aerospace & Technologies Corporation	Supporting Organization	Industry	Boulder, Colorado
●Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland
Inha University	Supporting Organization	Academia	Incheon, Outside the United States, Korea, Republic of
Massachusetts Institute of Technology Lincoln Laboratory(MIT-LL)	Supporting Organization	R&D Center	Lexington, Massachusetts
National Institute of Aerospace	Supporting Organization	Academia	Hampton, Virginia
Nexolve Corporation	Supporting Organization	Industry	Huntsville, Alabama
VIMS	Supporting Organization	Industry Veteran-Owned Small Business (VOSB), Women-Owned Small Business (WOSB)	

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Center Innovation Fund: LaRC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

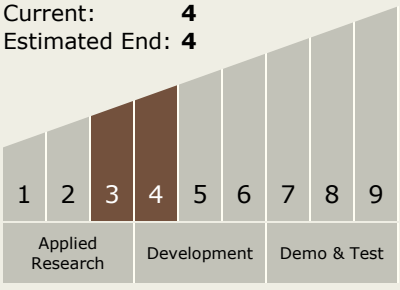
Julie A Williams-byrd

Principal Investigator:

David G Macdonnell

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Primary U.S. Work Locations
Virginia

Project Website:

https://www.nasa.gov/directorates/spacetech/innovation_fund/index.html#.VC

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.3 Aero Propulsion
    - TX01.3.1 Integrated Systems and Ancillary Technologies

Target Destination

Earth